

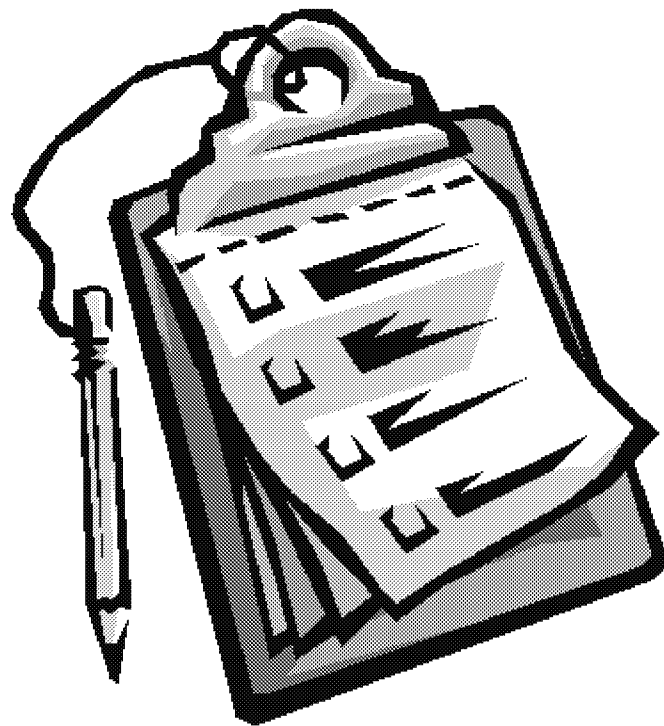
Water Quality Standards and Assessment

Highest Attainable Condition Discussion Draft Procedure for Municipalities

Presentation to Willamette Basin Mercury MDV
Advisory Committee
January 24, 2019
DEQ Headquarters, Portland, OR

Topics

- Context
- Discussion draft HAC flowchart and procedures
- Determining environmental and economic feasibility



Highest Attainable Condition

2. Effluent condition with greatest pollutant reduction achievable

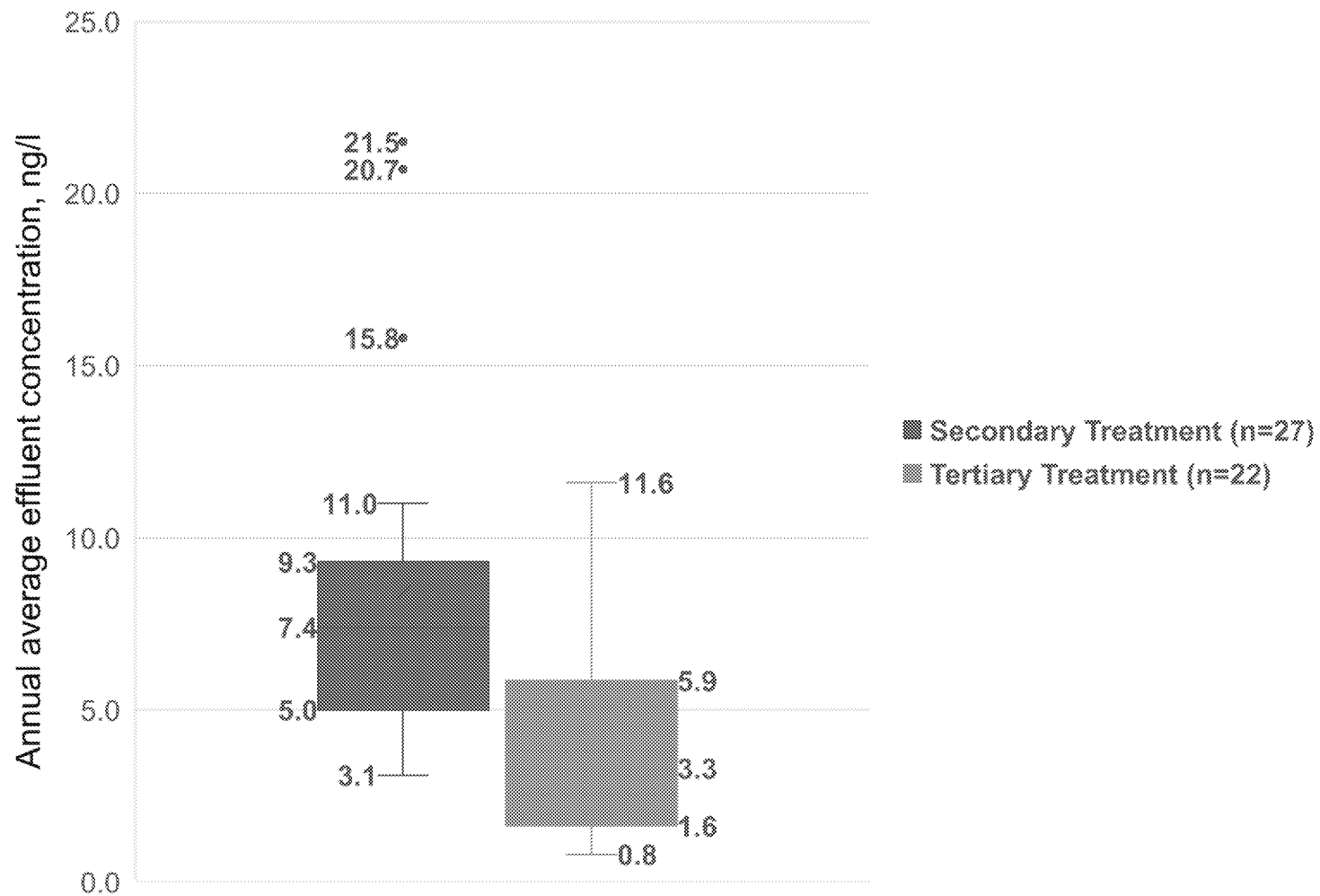
or

3. Effluent condition that optimizes current technology + pollutant reduction program

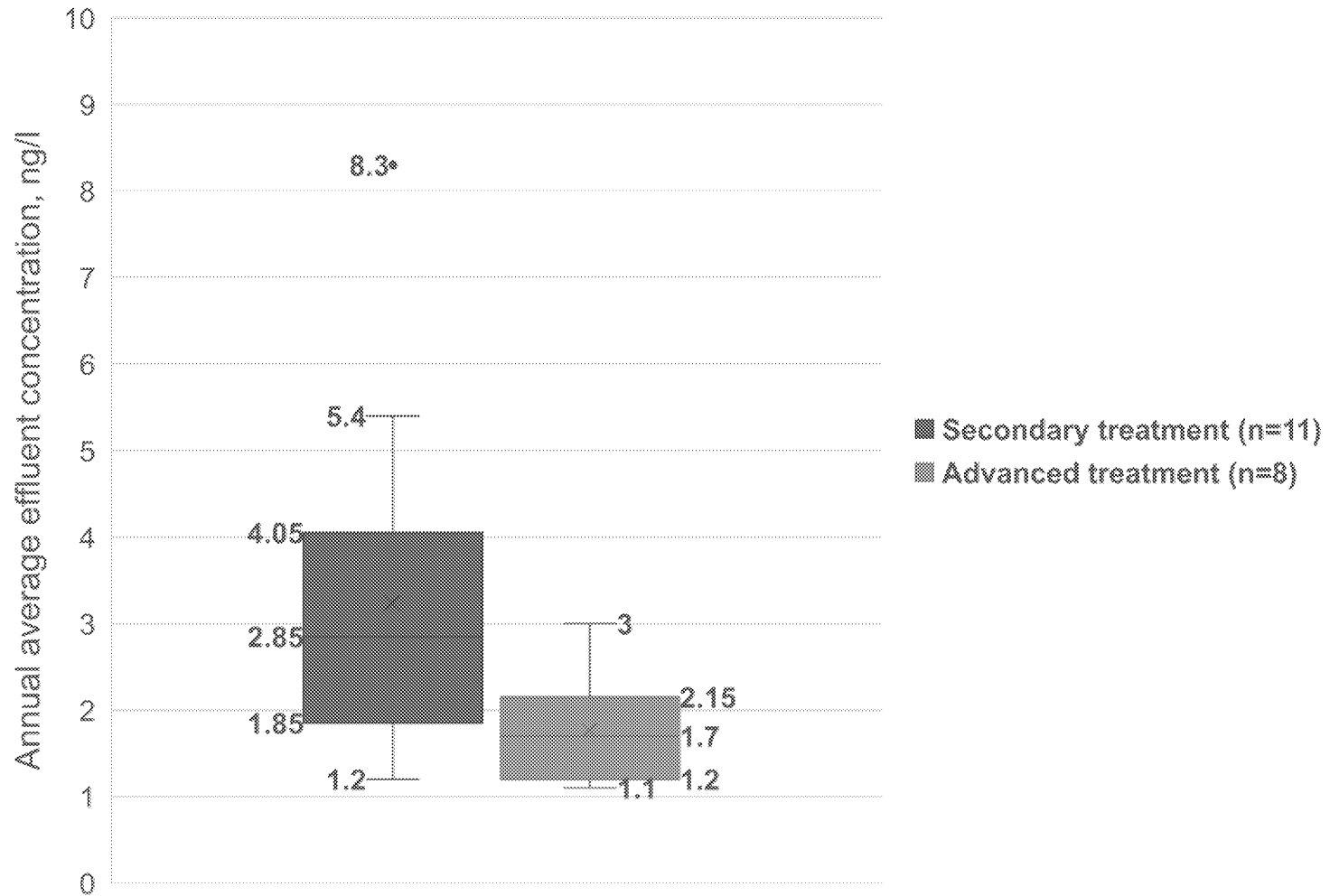
Limits of treatment

TREATMENT TECHNOLOGY	VOLUME RANGE OF KNOWN USES	TREATMENT ABILITY
Activated sludge	Up to 25 MGD	3-50 ng/L
Activated sludge w/ Nutrient Removal or Filtration	Up to 25 MGD	1-10 ng/L
Membrane Filtration	Low volume	Bench scale to 0.26 ng/L
Ion Exchange	0.015 MGD (5-50 GPM)	1 ng/L
Precipitation and filtration	Low volume	Bench scale to 0.17 ng/l; full scale to 25 ng/l
Adsorption	Low volume	Bench scale to 0.08 ng/l; full scale to 300 ng/l

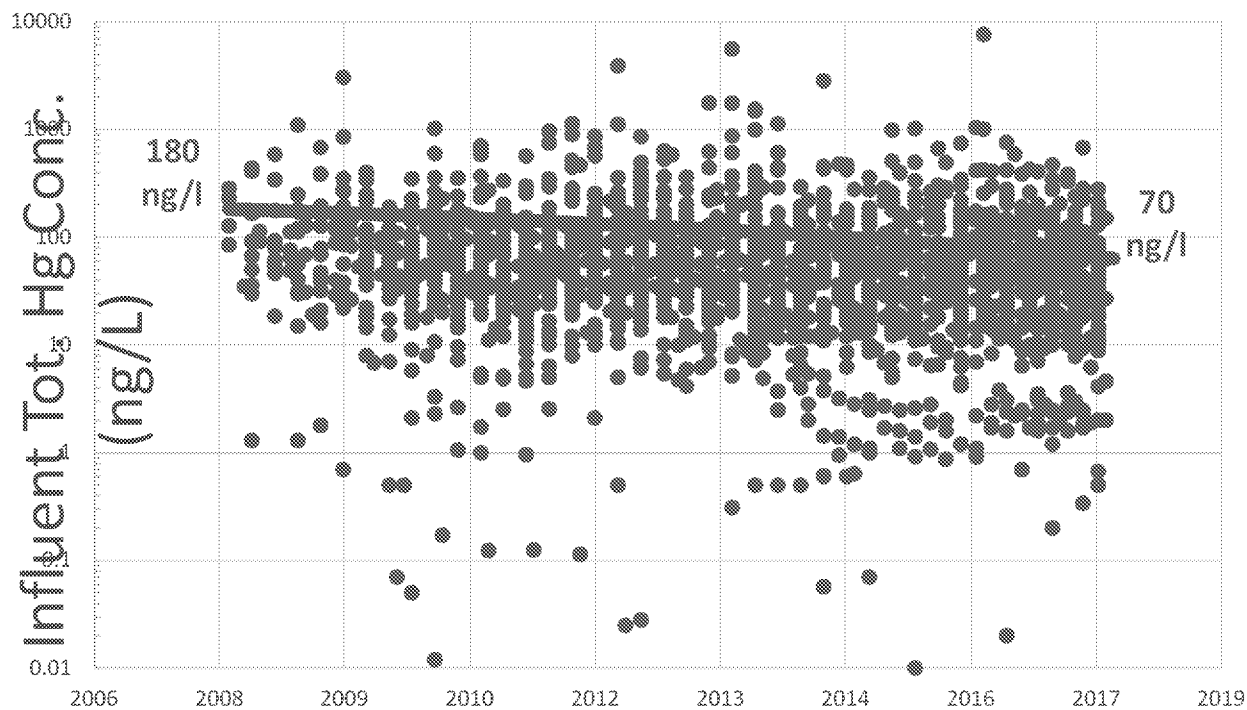
Avg. Tot. Hg Effluent Conc., Sacramento Delta WWTPs, 2004-5



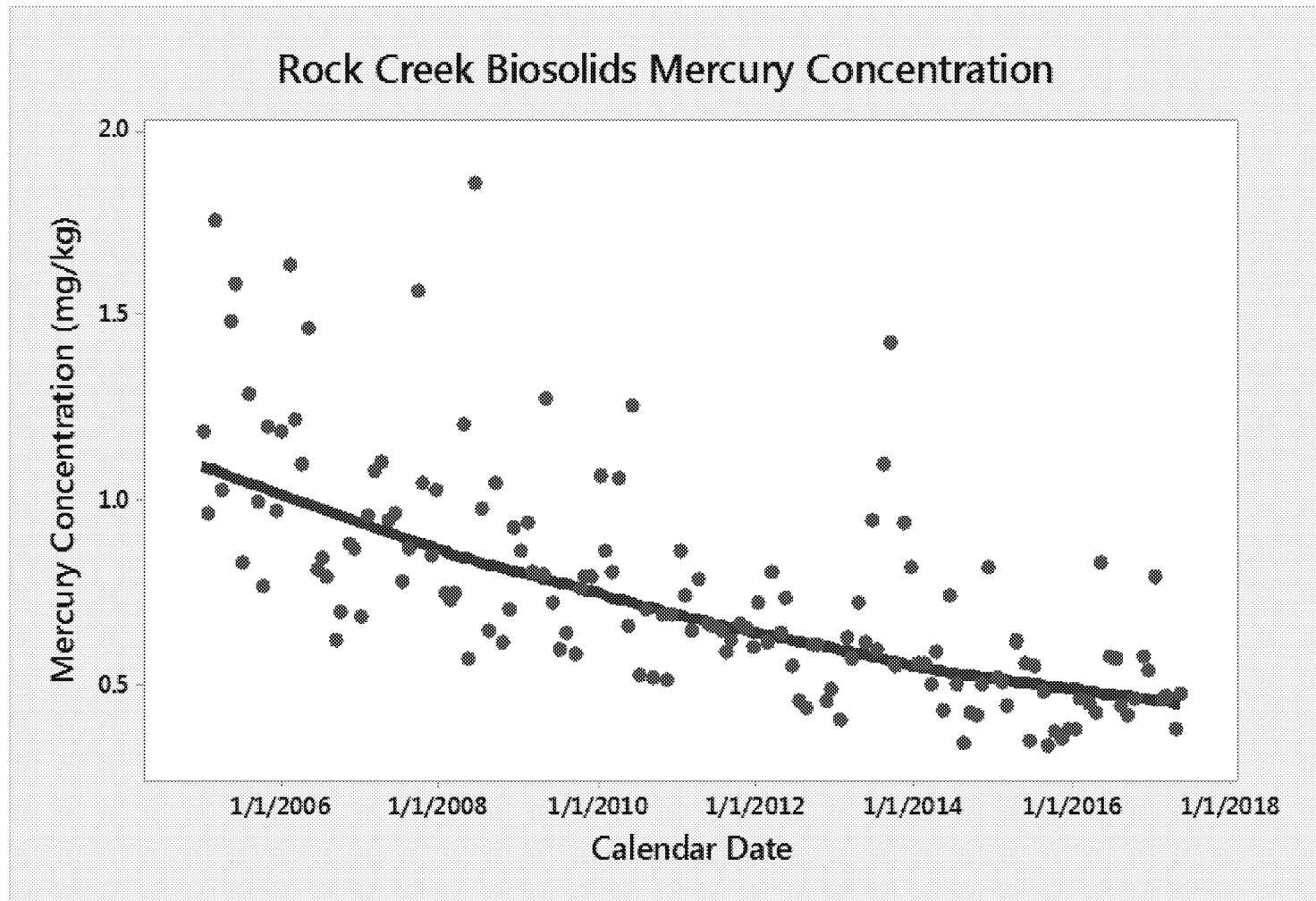
Oregon Pretreatment WWTPs, 2016



Effectiveness of source reduction

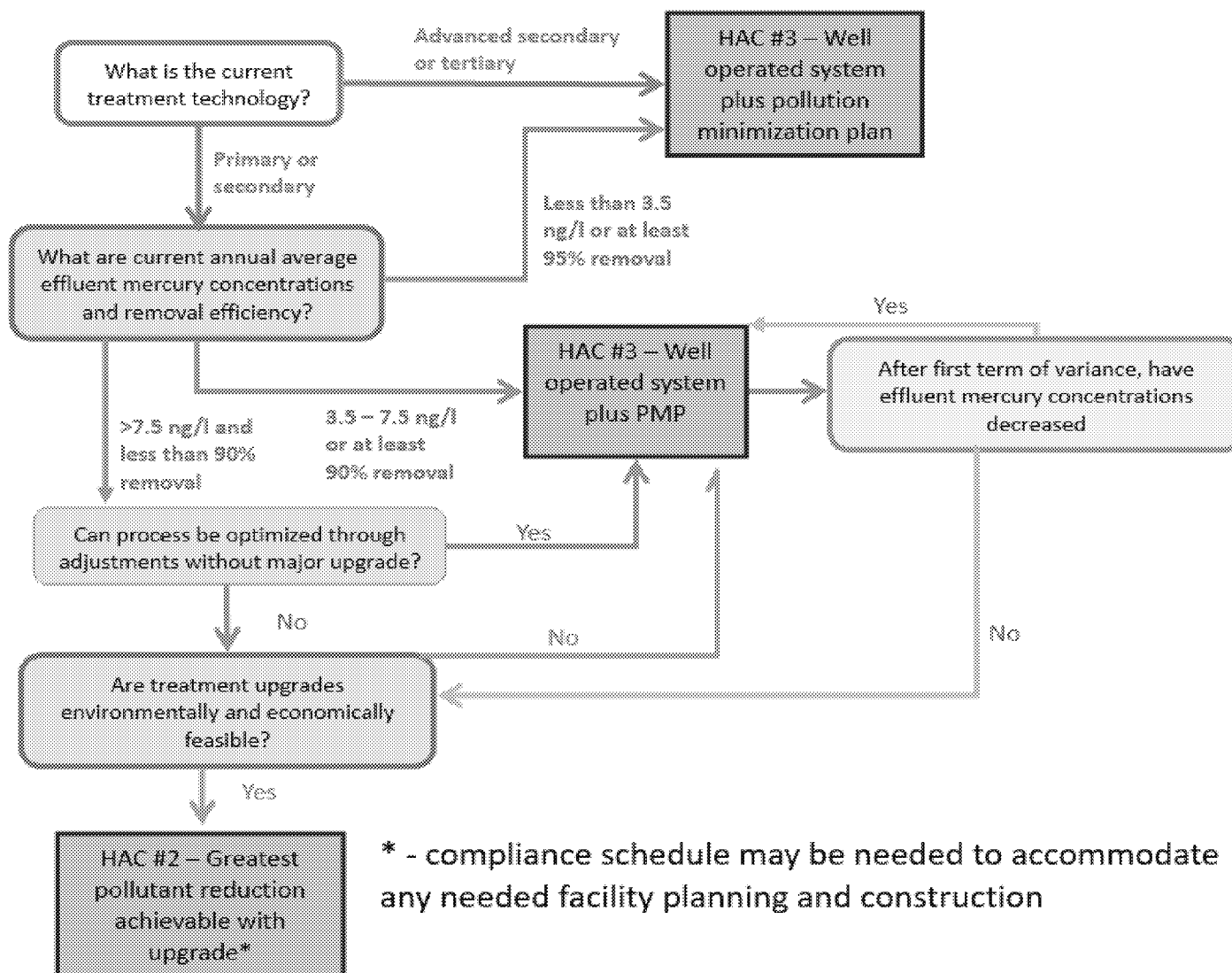


Effectiveness of source reduction

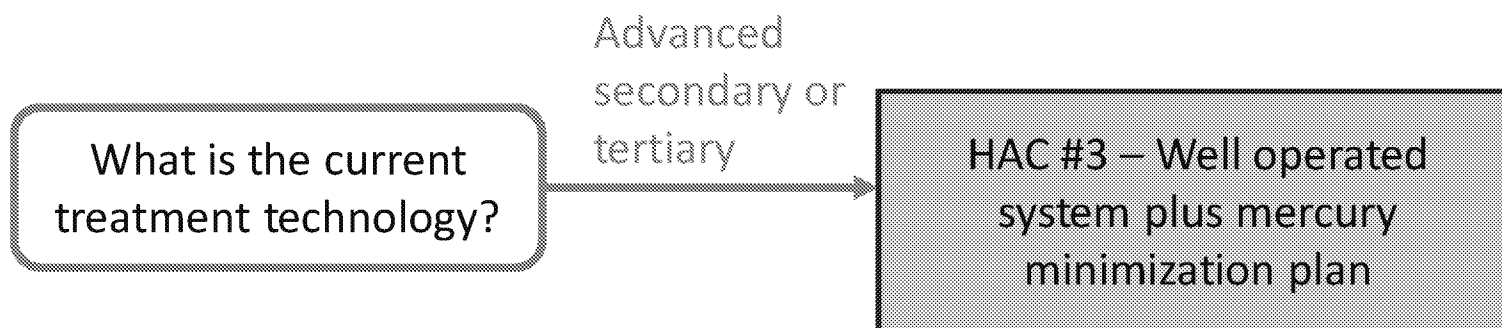


Conclusions

- Best proven treatment for mercury removal is advanced secondary or tertiary (1 – 3 ng/l)
- Some secondary systems also achieve low effluent concentrations, but some may not (1-21.5 ng/l)
- MMPs result in mercury reductions over time

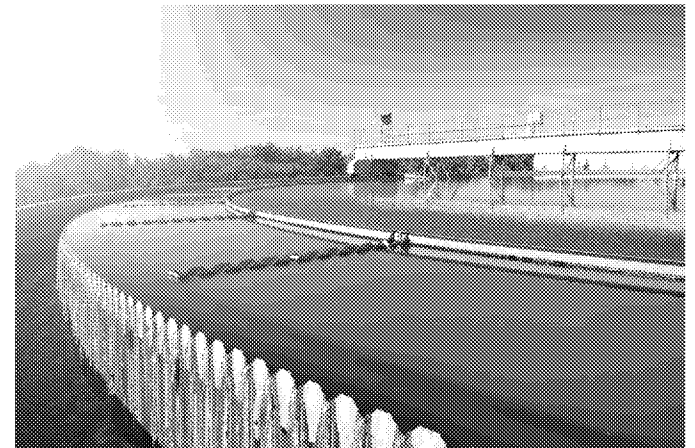


Advanced systems

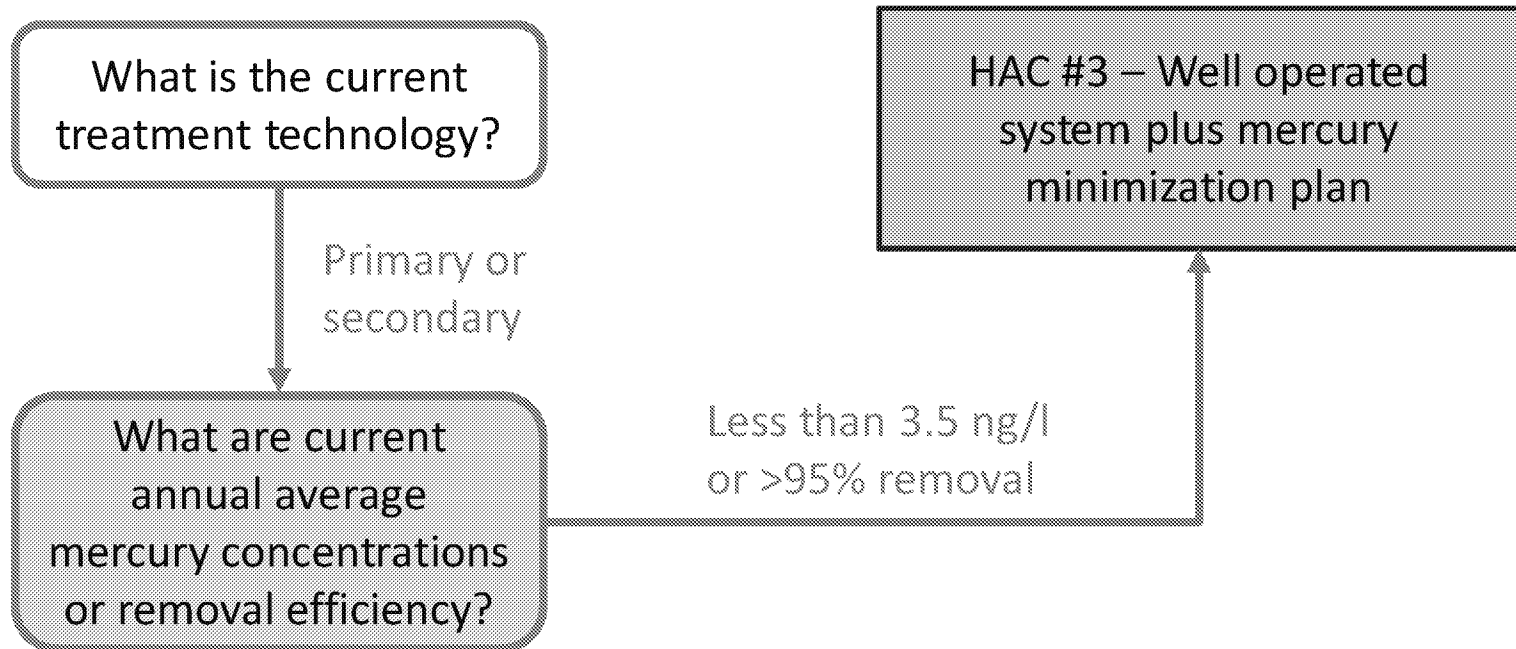


Rationale

- No proven treatment that can achieve additional mercury reductions
- Revisit technology at HAC re-evaluation to determine if there are any technological advances that are environmentally and economically feasible.



Other systems with very high treatment efficiency

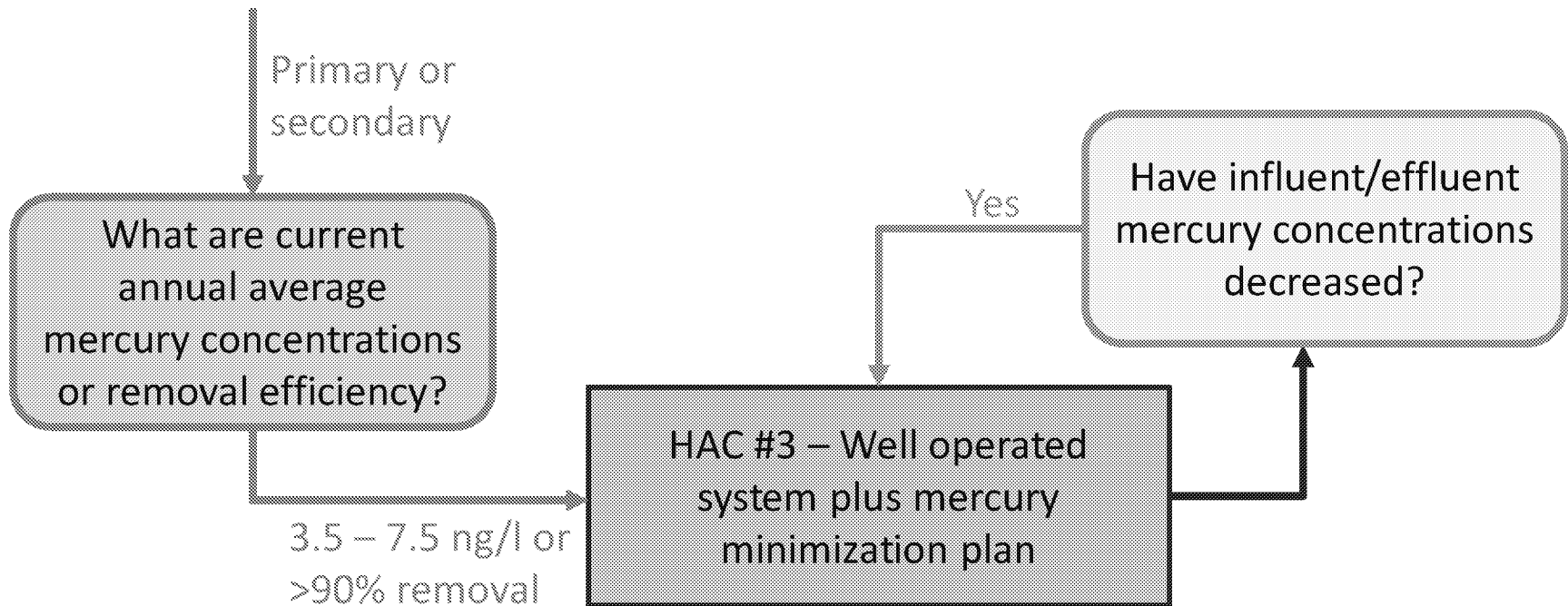


Rationale

- Treatment upgrades will not appreciably remove additional mercury.
- Revisit technology at HAC re-evaluation to determine if there are any technological advances that are environmentally and economically feasible.



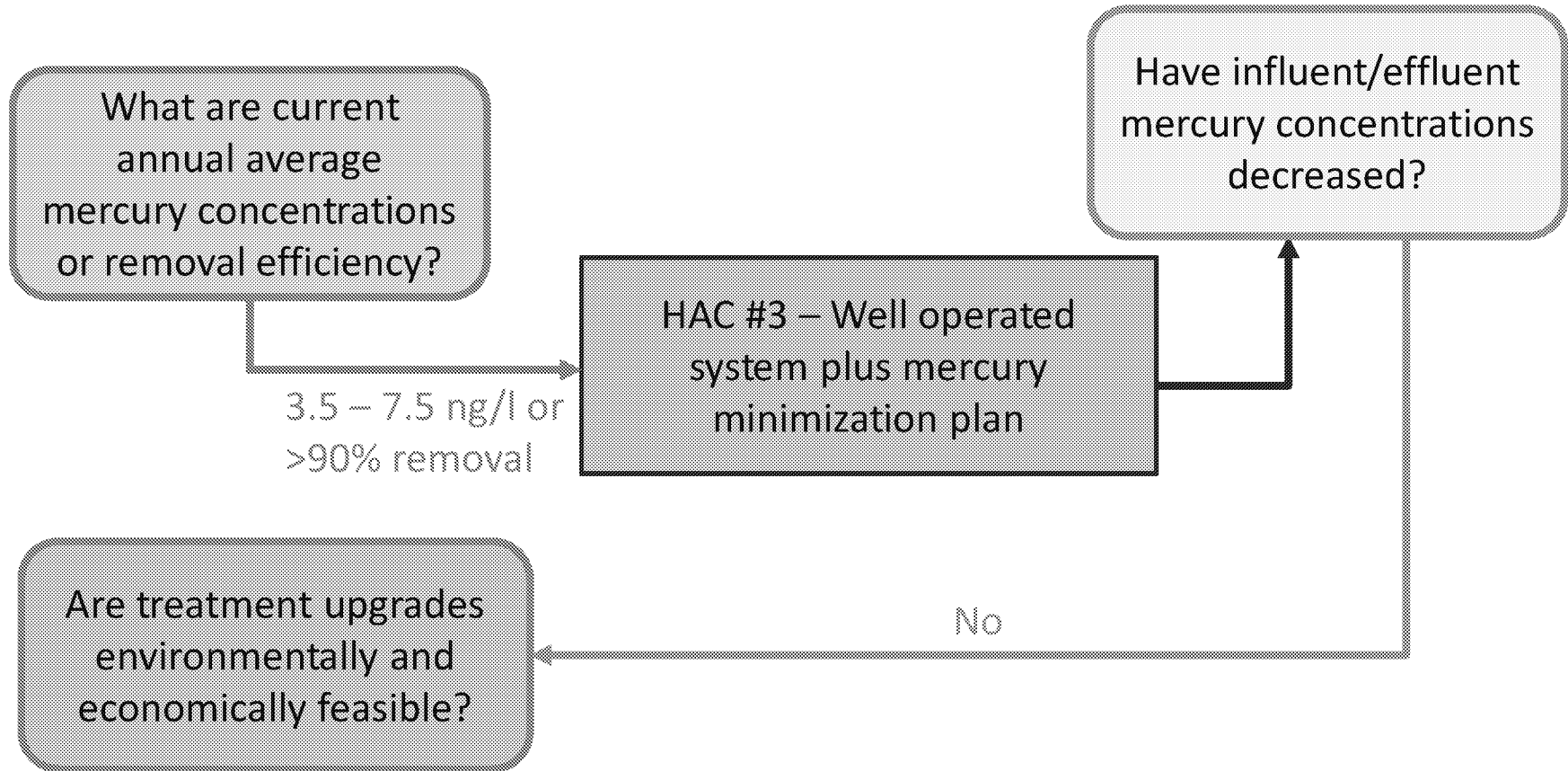
Systems with high treatment efficiency



Rationale

- Minimization plans effective and more environmentally and economically feasible than additional treatment.
- As long as minimization plans continue to decrease mercury levels, prevention/ source reduction is preferred over treatment.

Systems with high treatment efficiency and ineffective MMPs

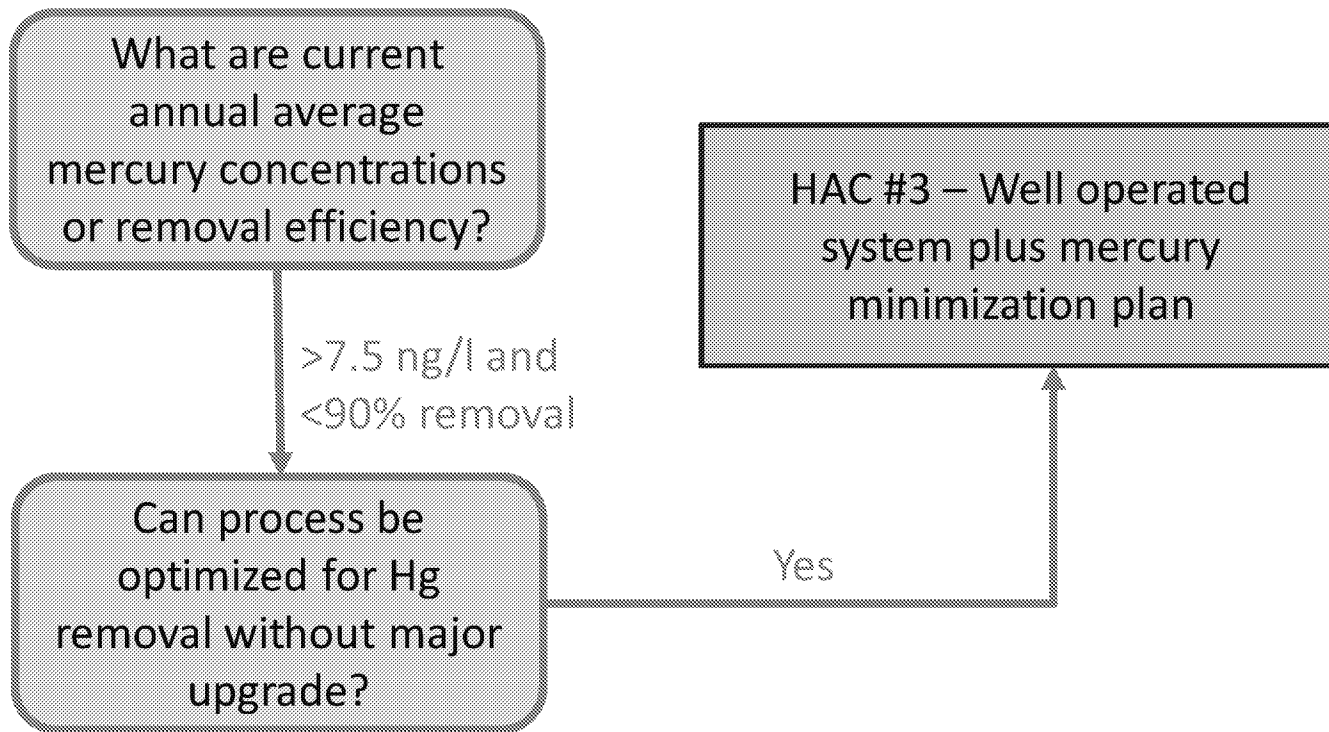


Rationale

- If minimization is ineffective, the facility needs to evaluate if treatment upgrades will achieve better outcomes.



Systems with moderate mercury removal efficiency

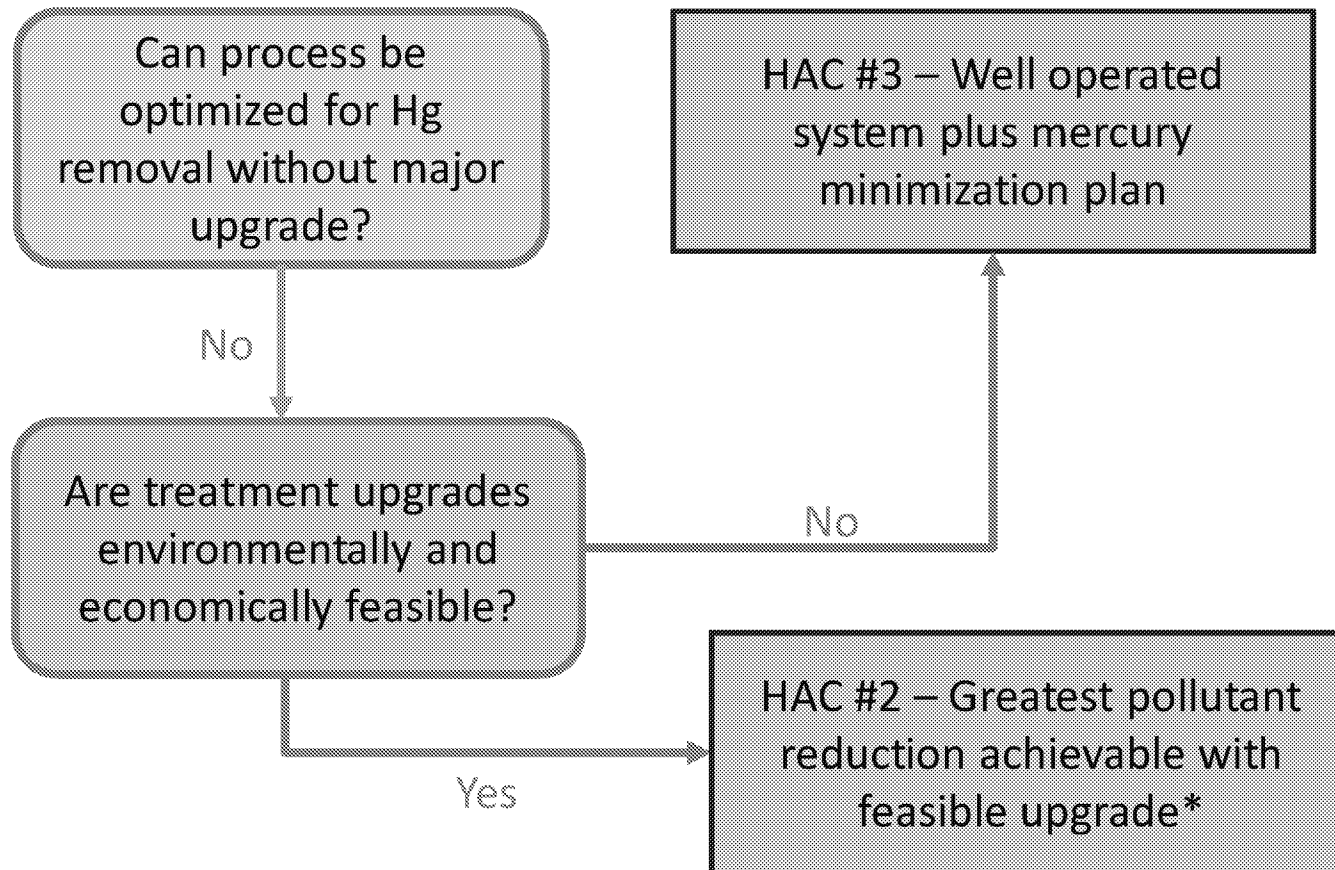


Rationale

- Optimization may be more environmentally and economically feasible than treatment upgrade.
- May require compliance schedule with interim effluent limit that is adjusted after optimization is online.



Systems with moderate treatment mercury removal efficiency



Rationale

- Justification for variance:
 - “...cannot be remedied or create more environmental harm to correct than leave in place.”
- Rationale for well-operated system & MMP
 - Point sources are very small (~1%) of mercury load in Willamette; limited benefit to waterbody.
 - Advanced treatment uses more energy and requires waste disposal
 - Advance treatment may be much more expensive
- In limited cases, additional treatment may be warranted or may be needed to address multiple pollutants.

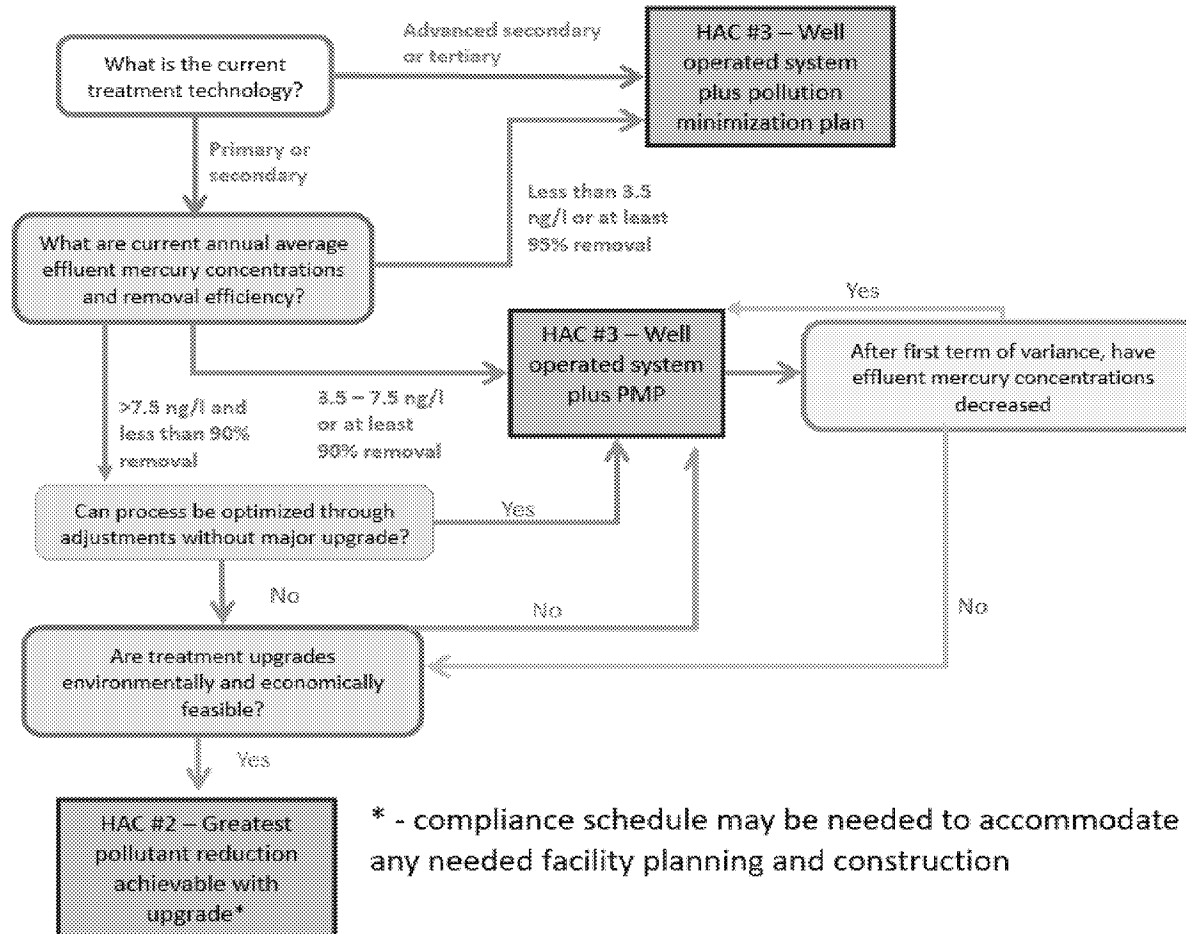
Environmental feasibility

Treatment Option	Estimated mercury effluent conc.	Estimated annual mass load savings (based on 1 mgd flow)	Energy costs (compared to current operations)	GHG and other emissions	Disposal impacts (compared to current technology)
Current treatment	8 ng/l	0	No change	No change	None
Current treatment plus MMP	5 ng/l	4.1 grams	No change	No change	No change
Advanced secondary	3 ng/l	6.9 grams	XX Mwh/year	XX lbs. CO2	Additional disposal of biosolids

Economic feasibility

- Different than “Factor 6”
 - Making progress toward standard, but not attainment.
 - EPA guidance regarding “substantial and widespread economic harm” not fully applicable, but may be useful.

Comments and discussion



* - compliance schedule may be needed to accommodate any needed facility planning and construction

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.

